What is claimed is

1. A process for producing a tool insert used in a mold for injection molding a part fabricated of a synthetic material, a metal or a ceramic material and which includes an arrangement of microstructures formed on an outer surface of the part and have a predetermined depth, said process comprising:

(a) photo-lithographically masking the front side of a first wafer with a first etching mask which corresponds to an arrangement of microstructures,

(b) micro-structuring the first wafer by means of plasma etching the front side of the first wafer to form an arrangement of microstructures which form cavities and whose depth extends over a part of the thickness of the first wafer,

(c) removing the first etching mask from the front side of the first wafer,

(d) bonding the front side of the first wafer to a carrier substrate to form a master,

(e) removing a layer of the first wafer to reveal the microstructures which have not been through-etched and to set the depth of the microstructures,

(f) applying an electrically conductive thin layer to the rear side of the first wafer and to the carrier substrate surfaces which can be accessed through the cavities mentioned,

(g) electrochemically depositing a metal layer on the rear side of the first wafer and in the cavities which are present therein and are formed by the microstructures,

(h) making planar the outer surface of the deposited metal layer, and

(i) separating the metal layer from the master, wherein the separated metal layer can be used as a tool insert for injection molding a part.

2. The process of claim 1 wherein the first wafer is a silicon wafer.

3. The process of claim 1 wherein the carrier substrate is a glass wafer.

4. The process of claim 1 wherein the carrier substrate is a silicon wafer.

5. The process of claim 1 wherein the deposited metal layer is a nickel layer.

6. The process of claim 1 wherein the microstructuring of the front side of the first wafer is performed by means of through-etching the first wafer with an undercut, so that the

microstructures formed have a cross-section whose width increases with the distance to the front side of the first wafer.

7. A process for producing a tool insert used in a mold for injection molding a part which is fabricated from a synthetic material, from a metal or from a ceramic material and which comprises an arrangement of microstructures which are formed on an outer surface of the part and have a predetermined depth, said process comprising:

(a) photo-lithographically masking the front side of a first wafer with a first etching mask which corresponds to an arrangement of microstructures,

(b) microstructuring the first wafer by means of plasma etching the front side of the first wafer to form an arrangement of microstructures, the depth of which extends over the entire thickness of the first wafer, so that the microstructures form cavities which have an orifice on the front side and on the rear side of the first wafer respectively,

(c) removing the first etching mask from the front side of the first wafer,

(d) bonding the front side of the first wafer to a carrier substrate to form a master,

(e) applying an electrically conductive thin layer to the rear side of the first wafer and to the carrier substrate surfaces which can be accessed through the cavities mentioned,

(f) electrochemically depositing a metal layer on the rear side of the first wafer and in the cavities which are present therein and are formed by the microstructures,

(g) making planar the outer surface of the deposited metal layer, and

(h) separating the metal layer from the master, wherein the separated metal layer can be used as a tool insert for injection molding a part.

8. The process of claim 7 wherein the first wafer is a silicon wafer.

9. The process of claim 7 wherein the carrier substrate is a glass wafer.

10. The process of claim 7 wherein the carrier substrate is a silicon wafer.

11. The process of claim 7 wherein the deposited metal layer is a nickel layer.

12. The process of claim 7 wherein the microstructuring of the front side of the first wafer is performed by means of through-etching the first wafer with an undercut, so that the

microstructures formed have a cross-section whose width increases with the distance to the front side of the first wafer.

13. A process for injection molding a part which is fabricated from a synthetic material, a metal or from a ceramic material and which comprises an arrangement of microstructures which are formed on an outer surface of the part and have a predetermined depth, wherein a tool insert is used in a mold for injection molding, said tool insert being formed from a first and a second tool half, said process comprising:

(a) installing a first tool insert as a first tool half which serves to shape the arrangement of microstructures, wherein the first tool insert is produced by the process of photo-lithographically masking the front side of a first wafer with a first etching mask which corresponds to an arrangement of microstructures, micro-structuring the first wafer by means of plasma etching the front side of the first wafer to form an arrangement of microstructures which form cavities and whose depth extends over a part of the thickness of the first wafer, removing the first etching mask from the front side of the first wafer, bonding the front side of the first wafer to a carrier substrate to form a master, removing a layer of the first wafer to reveal the microstructures which have not been through-etched and to set the depth of the microstructures, applying an electrically conductive thin layer to the rear side of the first wafer and to the carrier substrate surfaces which can be accessed through the cavities mentioned, electrochemically depositing a metal layer on the rear side of the first wafer and in the cavities which are present therein and are formed by the microstructures, making planar the outer surface of the deposited metal layer, and separating the metal layer from the master,

(b) installing a second tool insert as a second tool half which is arranged opposite the first tool half,

(c) closing the tool formed from the first and second tool insert for injection molding,

(d) injecting a material melt into the cavity between the first and the second tool insert,

(f) cooling the injected material melt and

(g) ejecting from the molding tool for injection molding a part which is formed by the setting of the injected material melt and which comprises microstructures with inclined surfaces which enable the part to be removed from the molding tool.

14. A process for injection molding a part which is fabricated from a synthetic material, a metal or from a ceramic material and which comprises an arrangement of microstructures which are formed on an outer surface of the part and have a predetermined depth, wherein a tool insert is used in a mold for injection molding, said tool insert being formed from a first and a second tool half, said process comprising:

(a) installing a first tool insert as a first tool half which serves to shape the arrangement of microstructures, wherein the first tool insert is produced by the process of photo-lithographically masking the front side of a first wafer with a first etching mask which corresponds to an arrangement of microstructures, microstructuring the first wafer by means of plasma etching the front side of the first wafer to form an arrangement of microstructures, the depth of which extends over the entire thickness of the first wafer, so that the microstructures form cavities which have an orifice on the front side and on the rear side of the first wafer respectively, removing the first etching mask from the front side of the first wafer, bonding the front side of the first wafer to a carrier substrate to form a master, applying an electrically conductive thin layer to the rear side of the first wafer and to the carrier substrate surfaces which can be accessed through the cavities mentioned, electrochemically depositing a metal layer on the rear side of the first wafer and in the cavities which are present therein and are formed by the microstructures, making planar the outer surface of the deposited metal layer, and separating the metal layer from the master,

(b) installing a second tool insert as a second tool half which is arranged opposite the first tool half,

(c) closing the tool formed from the first and second tool insert for injection molding,

(d) injecting a material melt into the cavity between the first and the second tool insert,

(f) cooling the injected material melt and

(g) ejecting from the molding tool for injection molding a part which is formed by the setting of the injected material melt and which comprises microstructures with inclined surfaces which enable the part to be removed from the molding tool.

15. A process for producing a portion of a mold, said mold being used to make a part having at least one microstructure formed on a surface thereof, said process comprising:

(a) etching said microstructure on a wafer

(b) attaching said wafer to a carrier substrate to form a master,

(c) depositing a material layer onto said master, said deposited material layer extending over said microstructure, and

(d) separating the deposited metal layer from the master, wherein the separated metal layer can be used as the predetermined mold portion.

16. A process for producing a predetermined portion of a mold, said mold being used to make a part having at least one microstructure formed on a surface thereof, said process comprising:

(a) etching said microstructure on a wafer, said microstructure extending downwardly from a first surface of said wafer;

(b) attaching said wafer to a carrier substrate to form a master, said wafer being attached to said carrier substrate with said first surface being adjacent to a second surface of said carrier substrate;

(c) depositing a material layer onto said master, said deposited material layer extending over said microstructure, and

(d) separating the deposited metal layer from the master, wherein the separated metal layer can be used as the predetermined mold portion.